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ORIGINAL MEMOIRS.

THE OPERATIVE TREATMENT OF TUMORS OF THE BLADDER.

A PROPOSAL TO SUBSTITUTE BILATERAL LUMBAR NEPHROSTOMY
AND THE ESTABLISHMENT OF RENAL FISTULAE IN CASES OF
BLADDER TUMOR, FOR URETERAL IMPLANTATION IN CONNEC-
TION WITH BLADDER RESECTION OR TOTAL EXTIRPATION, AND
THAT THE BLADDER OPERATION BE DONE AFTER AN INTERVAL
AND NOT TOGETHER WITH THE NEPHROSTOMIES.

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My object in this communication is to trace the steps by which I have been led to submit the proposal embodied in the above title.

The unsatisfactory results of surgical interventions in cases of bladder tumor caused me to seek for some means by which they might be improved, and eventually led to the belief that the manner of dealing with them in some cases in the way that will be described in the course of the paper promises to be one that is well worth a trial at any rate.

The first part of the paper will be devoted to a consideration of what has been accomplished hitherto by the operative treatment of these conditions. The latter part of it deals with the new plan of treatment which I have to suggest. The

sources from which the data have been derived are given in the bibliographical list at the end of the article, and in the tables to be found in the course of the text.

The data with regard to the results of the operative treatment of bladder tumors consist of reports of 653 cases. These include those which are in the classic and authoritative work of Albarran, published in 1892, and such others as I have taken from the literature and personal experience in the course of the succeeding 13 years.*

RESULTS OF OPERATIVE TREATMENT.

Of this series of 653 cases, 243 were benign and 410 were malignant tumors. The special varieties of neoplasms in each class were as follows:

Benign.—Papilloma, 203; myoma, 20; myxoma, 16; adenoma, 2; angioma, 2—243.

Malignant.—Carcinoma, 358; sarcoma, 52—410. Total, 653.

These cases have been studied with reference to

1. The mortality attending each special operative method in each special variety of tumor.

2. The frequency of recurrence and freedom from recurrence respectively that are seen in connection with the performance of each special operative method and in each variety of tumor.

Operative Mortality.—The general operative mortality in cases of benign tumors exclusive of myxoma is 12 per cent.; including myxoma, 17 per cent.

* Since this paper was read by me, at the meeting of the American Association of Genito-Urinary Surgeons, in Montreal, June 13, 1905, the report "On the Indications and Results of Surgical Treatment of Bladder Tumors," by Dr. Rafin, of Lyons, has been presented at the meeting of "l'Association Française d'Urologie," October 5, 1905. The ground covered by Rafin in this most instructive and admirable report includes practically the same data as those presented in this article, so far as they apply to the results of operative treatment of bladder tumors and the conclusions with respect to its result vary but little from those which are set forth in the present communication.

The operative mortality of carcinoma is 27 per cent.; that of sarcoma, 63 per cent.

Mortality with Reference to the Nature of the Operation and to that of the Tumor.—*Urethral Operations.*—Papillomata, 55 cases, 5 deaths, 9 per cent. mortality.

Malignant Tumors. Carcinoma, 20 cases, 4 deaths, 20 per cent. mortality.

Suprapubic Operations not Resections.—Papillomata, 131 cases, 21 deaths, 11.3 per cent. mortality; myomata, 13 cases, 2 deaths, 15.3 per cent. mortality.

Malignant Tumors. Carcinoma, 222 cases, 62 deaths, 28 per cent. mortality; sarcoma, 35 cases, 22 deaths, 63 per cent. mortality.

Partial Resections of the Bladder.—Papilloma, 17 cases, 1 death; myoma, 4 cases, 1 death. Total, 21 cases and 2 deaths; 9.5 per cent. mortality.

Malignant Tumors. Carcinoma, 91 cases, 17 deaths, 18.6 per cent. mortality.

Total Extirpation of the Bladder. Carcinoma, 25 cases, 14 deaths, 56 per cent. mortality.

One interesting detail which appears in connection with the mortality of the different operations is, that in the cases in which partial resections of the bladder were done for the removal of carcinoma, of which there were 91, the death-rate was but 18.6 per cent.; while in 222 cases, in which tumors of the same nature were removed by suprapubic operations *without* resection, the mortality was 28 per cent.

The mortality of the cases of myxoma and of sarcoma is, it will be noted, very high. Of the two cases of adenoma, one ended fatally, and the same was true of the two cases of angioma.

The lowest mortality shown in connection with any of the operations is that of the benign tumors removed by partial resection and that of the same class of tumor operated upon through the dilated female urethra or through the male perineal urethra.

Recurrence.—Rapid recurrence, from three weeks to eight

months after operations, followed in all but two of the cases of sarcoma and myxoma. In one of each of these classes of cases respectively, the patient survived more than one year.

Benign Tumors.—*Papilloma and myoma.* Rapid recurrence in 40 cases, or 20.5 per cent. of 195 survivors.

Carcinoma.—Rapid recurrence in 70 cases, or 26.8 per cent. of 261 survivors.

Operative Failures. (Deaths plus rapid recurrences.) Benign tumors, 72, or 29.6 per cent. of 243 patients. Carcinoma, 167, or 46.6 per cent. of 358 patients.

Freedom from Recurrence.—*Papilloma and myoma*, 64, or 34 per cent., were free from recurrence at the end of one year, and nearly 10 per cent. were free at the end of three years or more after operation. *Carcinoma*, free from recurrence at the end of one year, 28 per cent.; free from recurrence at the end of three years, 10 per cent.

A feature of much importance in connection with the question of recurrence or freedom from recurrence is the relative measure of the latter attained by the different methods of operating and in the special varieties of tumors. So far as could be determined from the writer's collected series of cases, this appeared to be as follows:

Papillomata.—Urethral operations, 55 cases; surviving,* 50; recurrence, 5 are reported; freedom from recurrence, less than 1 year, 4, more than 1 year, 14, or 28.2 per cent.

Suprapubic operations not resections, 131 cases; surviving, 110; freedom from recurrence less than 1 year, 10, more than 1 year, 40, or 27.5 per cent.

Partial resections, 17 cases; surviving, 16; recurrence, 4 are reported; freedom from recurrence, more than 1 year, 6, or 37.5 per cent.

Myomata.—Suprapubic operations not resections, 16 cases; surviving, 13; recurrence, 5 are reported; freedom from recurrence, less than 1 year, 3, more than 1 year, 3, or 23 per cent.

* Meaning surviving operation.

Resections, 4; surviving, 3; recurrence, 2 are reported; freedom from recurrence, 6 years, 1 case.

Carcinomata.—Suprapubic operations not resections, 227 cases; surviving, 160; recurrence, 36 are reported; freedom from recurrence, more than 1 year, 51, or 31.8 per cent.

Resection, 91 cases; surviving, 74; recurrence, 30 are reported; freedom from recurrence, more than 1 year, 15, 21 per cent.

Total extirpation, 25 cases; surviving, 11; freedom from recurrence, 8 years 1, 1 year to 15 months 4, 3 years 1, 3½ months 2, over 1 year 6, or 54.5 per cent.

The sum and substance of the result of the operative treatment up to the present time may be stated thus: If the operative deaths and rapid recurrences are combined under the one heading of operative failures, such failures are seen to have occurred in 28.6 per cent. of benign tumors, exclusive of myxoma, and in 46.0 per cent. of the cases of carcinoma.

In view of these facts, is it desirable to operate upon these cases radically or not? And if so, when, and upon which ones?

The factors which seem to me to enter into the decision may be placed in a credit and a debit column, for and against operation. Thus:

In Favor of Operation.

1. The condition, if not removed, is necessarily a fatal one, and is one that is beyond the reach of palliative treatment.

2. It is also a suffering condition in the later stages, and in a number of cases palliative treatment cannot relieve the suffering.

3. There are a few patients who have been apparently wholly cured, and a good many more for whom radical operations have secured long intervals of freedom from suffering and symptoms.

4. Because hydro- and pyonephrosis are frequently associated with the bladder tumor owing to the large number of cases in which the latter involves the orifices of the ureters, and because of the possibility of avoiding the above-named renal conditions, were operation done early enough.

5. And, lastly, because of the change from benign to malignant character of the tumors, which is believed to take place in a number of cases.

Against operation.

1. The large proportion of operative failures and the high mortality.

2. The fact that in many cases of benign tumors and in some of the malignant ones as well, there is a long interval between the appearance of the first symptoms and the time at which the patient's suffering is enough to cause them to seek medical advice. The length of this period may be judged from the following figures which are taken from Albarran:

In 56 cases of benign papilloma there were 19 in which this interval was between 3 and 8 years, 4 between 10 and 14 years, and one 30 years. In the remaining 32 cases the average length of time was two years.

In 76 cases of carcinoma the interval was from 3 to 12 years in 12, from 12 to 16 years in 4, but in the remaining 59, the time was less than 1 year.

3. The futility of operating in cases of carcinoma in which metastases are already present and the difficulty of determining whether they exist or not.

4. The hopelessness of operating in cases of sarcoma and myxoma.

Personally, the factors which favor operation outweigh those which are opposed to it in appropriate cases, by which is meant all benign growths and cases of carcinoma in which there is a fair probability that the malignant process has not as yet exceeded the limits of the bladder itself. We may now pass to the consideration of the part of the subject with which this communication is chiefly concerned.

The plan which I have to submit is not, as we have seen, a new surgical device or the introduction of a new method of technique, but consists in the application of a long established surgical procedure, for a purpose, however, for which it has thus far not been utilized. In view of the latter fact, this proposal can only be put forward as a suggestion; and the writer

desires to have it clearly understood that such is his intention in urging the adoption of a plan of treatment that is so radically different from that at present in vogue, and that he invites the fullest criticism of it.

The causes of the high mortality and of the frequent recurrence that have been shown in the first part of the paper to exist, seem to me to be in large measure due to the failure to operate soon enough and radically enough in cases of benign as well as in those of malignant tumors, and to the defects inherent in ureteral implantation.

The very large percentage of recurrence seems to point logically to the necessity of more radical measures in benign as well as in cases of malignant tumors, if we are to hope for better results. The suggestion that I have to make in this respect is, that total extirpation of the bladder, and of the prostate if it be involved in the pathological process be done at the outset in all cases of carcinoma that have not extended beyond the limits of the above named structures, and in which it is believed that there are no metastases, and that the same measure shall be applied in all cases of benign growths in which recurrence has taken place after a primary operation for their removal.

Ureteral implantation, which contributes, as it seems to me, to the surgical failures, should, I believe, be abandoned, and lumbar nephrostomy, with ligation of the ureters, done instead and at some time previous to the operation for the removal of the tumor, as it seems to offer a much safer and less objectionable way of disposing of the most difficult part of the latter operation.

Preliminary nephrostomy would seem to promise to replace the defects and dangers attaching to ureteral implantation with corresponding advantages, thus:

1. The time of the operation upon the bladder would be much shortened instead of being prolonged.
2. Liability to renal infection will be much less.
3. Nephrostomy supplies immediate and sufficient drain-

age of the kidney, instead of the imperfect one afforded by ureteral implantation, and is the best means at our disposal for giving prompt relief to renal retention, whatever be its character; and, as we know, renal retention is frequent in connection with bladder tumors owing to compression of the orifices of the ureters because of the large number of the neoplasms which have their seat in the lower third of the organ.

In some cases the nephrostomy could be utilized for relief that might be expected to result from diverting the urine from the bladder. When, for instance, the case was an inoperable one.

The latter point is one that the writer would lay special stress upon. It would seem reasonable to assume that much relief would be experienced from the absence of the repeated irritation of the filling and emptying of the bladder by the urine, which would be gained by the nephrostomy, and should this prove to be the case, it might under some circumstances be wise to go no further than that.

The great advantage, of course, in having done a preliminary nephrostomy is that, at the time of the bladder operation for the removal of the tumor, the whole question of the diverting of the urinary secretion and having to deal with the ureters is done away with. One would not have to think of that—the most difficult part of the operation—when attacking the tumor itself; moreover, the risks of the urine entering the peritoneal cavity would be avoided, and thus much less danger would be encountered in approaching the bladder transperitoneally, which would greatly facilitate the performance of the removal of the bladder and of the tumor and shorten the time required for it.

Thus far the writer has proceeded on the *assumption* of the superiority of nephrostomy as compared with ureteral implantation for effecting the same object. It remains to be shown on what grounds this opinion rests. To this end he has collected the data of ureteral implantation and of nephrostomy, which are given below in order to compare the

results of the one with the other with reference to the dangers and the disability attaching to each of the two procedures *per se*.

Results of Ureteral Implantation.—Total number of cases, 114.

	Cases.	Died.	Due to Implan- tation.
Maydl's operation for ectopia vesicæ.....	42	9	3
For injuries during abdominal operations....	22	9	3
Implantation on abdominal surface.....	6	4	2
Implantation in loin	4	3	2
In connection with bladder resection.....	15	8	5
In connection with total extirpation for the removal of bladder tumor.....	25	14	6
	114	47	21

Operative mortality, 41.2 per cent. Due to ureteral implantation, 44.6 per cent. of fatal cases.

Results of Nephrostomy.—For the purpose of learning these results, the series of 626 cases collected by Schmieden have been taken and to it have been added 353 others collected by the writer, making a whole series composed as follows:

	Cases.	Died.	Mortality.
Complete renal retention with anuria.....	65	9	15.2 per cent.
Hydronephrosis	143	5	3.4 per cent.
Simple and calculous pyonephrosis.....	145	28	19.3 per cent.
	353	42	11.8 per cent.
Schmieden's series of nephrotomies done for various conditions of the kidney..	626	102	16.2 per cent.
	979	144	15 per cent.

Maydl's operation for ectopia vesicæ may be taken as the nearest estimate which we can obtain of the dangers of ureteral implantation into the bowel, since the patients upon whom it has been performed have not been suffering from grave systemic conditions at the time. There is no means of judging the danger of nephrostomy upon like grounds, since it is never done except in the presence of disease and usually disease of a severe nature. The series of Maydl's operation has been included in the calculation of the percentages of deaths due to

ureteral implantation given above, but does not, of course, make the comparison a fair one to the results of nephrostomy. If the Maydl operation cases are omitted from the calculation, the operative mortality of the remaining 72 of the whole number becomes 50 per cent., while death was due to ureteral implantation *per se* in 50 per cent. of the fatal cases.

The difference between this and the mortality from any and all causes,—15 per cent.,—in the nephrostomy series, needs no comment.

It should be remembered also that in ureteral implantation into the bowel or onto the surface a considerable number of deaths results later from ascending renal infection, whereas it is very rare to have the kidney infected after nephrostomy, provided adequate drainage be maintained.

The opinions of Albarran and Legueu may be appropriately quoted here with reference to the dangers of renal incision and drainage.

Speaking of nephrostomy in connection with normal kidney and with reference to the question of what harm, if any, results from opening and draining it through the loin, Albarran speaks as follows:

"In these cases one is struck, first of all, with the absolute impunity which the incised and exposed renal tissue enjoys. The open kidney remains indifferent to contacts and pressures; foreign bodies which are introduced into or remain in it (drains, gauze, etc.) do it no harm; the lips of the renal incision may be pierced or drawn apart by retractors without injury, the interior of the organ may be curetted, injections of medicated fluids may be made, all without injury. The urine continues to be abundantly secreted and remains practically normal in character."

"All of which things show that nephrostomized kidneys are but very little liable to infection, and that the alterations of their parenchyma are but very slight; and, as a matter of fact, infection following this free communication of the interior of the kidney with the external surface of the body is very rarely followed by infection."

"When nephrostomy is done under different circumstances, in cases of renal retention, whether complete or incomplete, aseptic or septic, the same resistance to infection on the part of the kidney is seen, and the function of the organ is more or less perfectly resumed according to the amount of injury which it has sustained prior to the removal of the obstacle to the urinary outflow."

Leguen says, "In renal infections the dangers attaching to nephrostomy are, *per se*, almost nothing. The operation is necessary to have done under certain circumstances, and the dangers attending its performance are only such as are necessarily inherent in any operation that is performed in the presence of grave systemic conditions of any sort."

These statements reflect, I think, the opinions of most surgeons of experience in this matter. The objections, therefore, to lumbar nephrostomy are not on account of its dangers, but because of the disability and distress which are believed by many surgeons to be inflicted upon the patients.

I cannot help thinking that this impression is owing to the fact that there are very few cases indeed, if one may judge by those reported, in which such patients are properly cared for. The reports almost invariably refer to them as being discharged from the care of the surgeon without any proper provision being made for drainage or cleanliness. The majority of the patients have been of the laboring class, many of them of a low order of intelligence, and living in surroundings in which proper treatment of the fistulæ was impossible to secure. It is not remarkable, under such circumstances, that the renal fistula should be a source of distress to the patients and to others with whom they are brought in contact. It is not for such as these that the writer would propose to apply the plan he has submitted here. But when good care can be obtained, he is confident that maintaining renal fistula is not only compatible with a useful and an active life and with comfort, but that it is the safest course under the circumstances in which it is here proposed to employ the procedure, and that it is, moreover, the means of prolonging life and of preserving the good health of the individual upon whom it is practised.

That these things may be secured by the operation, the writer has demonstrated in one of his own cases in which *eleven years ago* he did a left lumbar nephrostomy for the relief of an acute pyonephrosis, and established a permanent fistula in that loin. Three years since, my colleague, Dr. Paul Thordike, performed a similar operation upon the other kidney

of the same patient. For this individual the writer made a special apparatus of a very simple sort which the patient has continued to wear for the purpose of draining the two kidneys during the periods which have elapsed since the two operations. Not only has he remained in excellent health throughout this long number of years,—the last three with fistulæ in both loins—but he has led an active, busy life, has suffered no distress whatever, and no one but himself has been aware of the fact that he was living under such conditions. The urine from both kidneys is nearly normal.

Mr. Morris reports two similar cases, one of the patients having single, *the other double renal lumbar fistulæ*, and both patients were in excellent health and in comfort, 1 for 7 years and the other for 16 years.

In addition to these three cases, the writer has collected forty-four others, in which the subsequent histories of patients with permanent lumbar renal fistula is more or less fully reported. Of this series, there were 8 in which the reports state that the patients were in health, comfort, and leading active lives, but in which the length of the times subsequent to the operations was not noted. In 2 it was mentioned as being for several years, in 1 for 8 years, 1 for 7 years, 2 for 5 years, 1 for 4 years, 3 for 1 year, and 2 for 18 months. In 3 others infection occurred, secondary nephrectomies were done, one with fatal result. In four others the fistulæ closed spontaneously at the end of from one to two years.

The point that has not been touched upon as yet is the danger attending the preformance of bilateral nephrostomy. There are but very few data from which to estimate this in the human subject. Experiments upon animals are not to be relied upon for this purpose. We know that they give too unfavorable a view of the results of ureteral implantation, for example, while, on the other hand, the results of bilateral nephrostomy when done upon dogs may give too favorable an impression to allow conclusions with regard to the human being to be drawn from them. The cases in which *bilateral nephrostomy at one sitting* has been done upon the human subject are

as yet very few, and in all of them with which the writer is familiar the patients have had very grave renal and systemic conditions at the time. Thus, Reynier reports four in which the operation was done under such circumstances with fatal results, and consequently is pessimistic with regard to it. On the other hand, such things as the following stand in favor of the procedure in greater or less degree:

When the two kidneys have been nephrostomized with an interval between the two operations, the results have been excellent in the cases reported,—*e. g.*, the two cases of Morris and that of the writer cited above.

Again, we have seen a number of cases in which nephropexy on one kidney and exploratory nephrotomy on the other have been performed simultaneously with success.

Reginald Harrison has shown the relief afforded to renal congestion by simple splitting of the capsule or renal incision in cases of scarlatinal nephritis.

We know that the best means of saving life in cases of acute or chronic renal retention is by a promptly performed nephrostomy. The same thing has been shown to be true of cases of post-operative amuria following operations on the genito-urinary tract. The bearing of the above statements upon the writer's proposal is too obvious to call for discussion.

Technique.—There is little, if anything, novel in the manner in which I would suggest that the plan of treatment proposed by me should be carried out. Its details would necessarily vary a good deal in different cases. Speaking in a general way, in order to include the whole of the method by which it seems to me it could best be done, it may be described thus:

1. Lumbar nephrostomy, bilateral, or unilateral at first, and, if this operation were well borne, to be followed by the same on the other kidney later. *In either case an interval of four to six weeks before the bladder operation was undertaken.* Or, as an alternative in certain cases, inoperable malignant disease of the bladder, should the patient's condition be markedly improved by the diversion of the urinary secretion through the new channels, to be content to go no further than the performance of the nephrostomy.

In doing the operations upon the kidneys, *the ureters should be picked up and ligated at whatever point was the most convenient in each individual case, but preferably as close to the renal pelvis as possible.*

2. Total extirpation of the bladder to follow the nephros-tomy one month or so later.

(a) Abdominal incision in the median line extending upward from the middle of the symphysis pubis and opening the peritoneal cavity.

(b) Place the patient in Trendelenburg posture, push the intestines away from the bladder, so that the latter is thoroughly exposed, and retain them there by packing with large gauze pads.

(c) Incise the peritoneum in the middle line over the summit of the bladder from the anterior insertion of the membrane to its posterior one. Strip the peritoneum off of the outer surface of the bladder, ligating the ureters when they are met. If there is any part of the peritoneum involved by the pathological process, resect that part and leave it upon the bladder. The ureters should be ligated as high up as possible.

(d) When the prostate has been reached, it should be removed together with the seminal vesicles and the bladder, if there is any doubt as to their being involved in the process; if not, they may remain. In the former case, the bladder being drawn as far upward into the wound as possible, a double ligature should be passed from behind forward with a long curved needle through the middle line of the urethra at the junction of the membranous and the prostatic portions, and each half of the organ should be tied in such a way as to include the blood-vessels on either side. A second ligature should then be passed in a similar manner a little anterior to the first one and tied. The tissues are then to be divided between the two ligatures, and the bladder removed.

(e) A better way to accomplish the removal of the organ would be to approach it from the perineum and from above the symphysis, doing a combined operation, separating the rectum from the prostate in the usual way,—i. e., by dividing the tendinous centre, of the perineum and blunt or finger separation

between prostate and rectum. Ligating the structures transversely as just described above then proceeding to complete the removal of the bladder from above the symphysis as already described.

If the disease does not involve the prostate and vesicles, those structures may remain undisturbed. In that case the bladder would be cut across transversely between two ligatures, and the divided edges of the lower portion just above the prostate would be either left thus or sutured over the base of the prostate, as might be thought to be best.

There would seem to be no objection to removing the prostate and vesicles in all such cases as we are considering; the difficulties of the operation would not be materially increased, and there would be far less chance of leaving behind any of the diseased tissues.

(f) Cleanse the operative field, close the peritoneal opening, and ligate any bleeding points.

(g) Close the abdominal wound entirely and drain by the perineum, or nearly close the abdominal wound and drain through it *and* the perineal wound, which would be sutured partly.

The chief point that seems to the writer to be of interest in this manner of removing the bladder is that the approach from both the perineum and a free laparotomy offers so much greater facility for accomplishing the extirpation of the structures involved and secures much greater thoroughness than if the operation is undertaken extraperitoneally; while at the same time the bladder, not being opened at all, makes the risk of intraperitoneal infection much less than when the contrary is the case, as it is when done in the usual way of performing the operation.

As has been said, the proposal which I have now submitted, together with the reasons which have led me to make it, are put forward only as suggestions, since we have as yet no actual experience in the matter; but these seems to be good ground for believing that they may prove to be of decided advantage if skilfully applied. We must remember that the

means hitherto devised have been far from satisfactory, *and that we are dealing with a very grave condition at best.* The proposed method of dealing with these difficult cases would therefore seem worthy of a fair trial.

Appended are tables of 20 cases of myomata in which operations were performed, and of 25 cases in which total extirpation of the bladder has been done for the removal of ureteral implantation in connection with the removal of bladder tumors.

TUMORS OF BLADDER.

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CASES OF MYOMA.

Operators.	Method of Operation.	Deaths.	No Recurrence.	Recurrence.
Tassi	Vaginal cystotomy.	0	.....	.....
Nicholich	Through perineal urethra.	Died in 5 months.	.....	.....
Karstrom	Suprapubic cystotomy ; galvanocautery.	0	.....	.....
Gerard Marchand ..	Suprapubic cystotomy ; tumor excised.	Died in 6 months.	None.	.....
Ramsay	Same.	0	.....	.....
Guyon	Same, removal with curette.	0	None.	.....
Dittel	Suprapubic cystotomy and excision.	1	.....	.....
Gibbons and Parker	Same, and removal with galvanocautery snare.	0	None.	.....
Terrier and Hartmann	Same, and enucleation of tumor.	0	.....	14 months ; second operation, and recovery.
Nauman	Same, removal by morcelllement.	0	.....	.....
Volkman	Same, removal by excision.	1	.....	.....
Albarran	Suprapubic cystotomy and excision.	0	.....	.....
Polailon	Transperitoneal suprapubic cystotomy.	1	.....	.....
Warholm	Suprapubic cystotomy and resection.	0	.....	.....
Verhoogen	Same.	1	.....	.....
Ceci	Same.	0	.....	.....
Kraske	Same.	0	6 years.	.....
Schatz	Through female urethra.	0	.....	Twice ; 1 year, again at 6 months.
Jackson	?	0	.....	.....
Thompson	Urethral.	0	.....	In 2 months.

CASES OF TOTAL EXTIRPATION OF BLADDER FOR BLADDER TUMORS.

Operator and Date.	No.	Age.	Sex.	Disease and Situation.	Operation.	Ureteral Implantation.	Result, Recovery, Death.
Bardenheuer, 1887.	1	..	M.	Carcinoma.	Bladder extirpation.	Left, without any implantation; death not referable to ureteral implantation.	Died fourteenth day; uremia, hydronephrosis (double); uremia due to the operation.
Pawlik, 1888.	1	56	F.	Carcinoma.	Bladder extirpation.	Vaginal.	Recovery; patient was living and well at end of three years.
Kuster, 1891.	1	53	M.	Carcinoma.	Bladder extirpation.	Rectal.	Died fifth day; pneumonia; kidney pelvis, ascending infection.
Kummel, 1890.	1	60	F.	.....	Bladder extirpation.	One through urethra by ureteral catheter, other not drained.	Died of shock next day.
Kossinski, 1894.	1	..	F.	Carcinoma.	Bladder extirpation.	Vaginal implantation.	Recovery.
Tuffier, 1895.	1	40	M.	Carcinoma.	Bladder extirpation.	Rectal.	Recovery; died fourteen months later; details of death lacking.
Giordano, 1895.	1	60	F.	Carcinoma.	Extirpation of bladder; ligature of internal iliacs; abdominal hysterectomy; nephrolithotomy; symphysectomy.	Rectal.	Died of shock in twenty-four hours.
Chalot, 1898.	1	45	F.	Carcinoma, also of uterus.	Abdominal hysterectomy; ligature of internal iliacs; extirpation of bladder.	Rectal.	Recovery; one year later patient was living.
Vasilief, 1895.	1	30	M.	Carcinoma.	Extirpation.	Angle of abdominal wound.	Recovery; well four months later.
Giordano, 1897.	1	50	F.	Sarcoma.	Total extirpation of bladder and abdominal hysterectomy.	Into sigmoid flexure.	Died twelfth day; pyelonephritis.

Turetta, 1897.	1	33	M.	Carcinoma.	Extirpation of bladder.	Rectal.	Died sixteenth day; acute ascending renal infection.
Schede, 1898.	1	55	M.	Carcinoma.	Extirpation of bladder.	Rectal.	Died third day of shock.
Winiwarter, reported by Hogg, 1898.	1	45	M.	Carcinoma.	Removal of bladder and external genitals.	Rectal.	Recovery. Three years later, no recurrence; the patient was living in comparative comfort.
Krause, 1899.	1	17	M.	Tumor of bladder compressing the left ureter.	Extirpation.	Rectal.	Recovery; three and a half months later was in excellent health.
Lund, 1902.	1	57	M.	Carcinoma.	Extirpation.	Rectal.	Died fourth day; uremia, acute ascending renal infection.
Harris, 1901.	1	53	M.	Carcinoma.	Extirpation, except a small bit of vertex of bladder.	Sutured to surface of suprapubic wound.	Died two months later of pneumonia.
Mayo Robson, 1903.	1	42	F.	Carcinoma.	Extirpation.	Vaginal implantation.	Died thirteenth day of uremia.
Woolsey, 1903.	1	37	M.	Carcinoma.	Extirpation.	One ureter rectal implantation, the other drains through the suprapubic wound with a ureteral catheter.	Recovery; did well for six weeks, then failed, and died three and a half months after operation; ascending renal infection.
Kayser, 1903.	1	..	..	Carcinoma.	Extirpation.	Neck of bladder.	Died.
McCosh, 1903.	1	50	F.	Carcinoma.	Extirpation.	Ureters cut across an inch from the bladder and cut ends allowed to drain into retroperitoneal pelvic tissue.	Recovery. Fifteen months later, no recurrence; leading an active life.
McCosh, 1903.	1	..	..	Carcinoma.	Extirpation.	The same.	Recovery. Thirteen months later, no recurrence; leading an active life.

CASES OF TOTAL EXTIRPATION OF BLADDER FOR BLADDER TUMORS.—*Concluded.*

Operator and Date.	No.	Age.	Sex.	Disease and Situation.	Operation.	Ureteral Implantation.	Result, Recovery, Death.
George Tulley Vaughan, 1903.	1	32	M.	Sarcoma.	Extirpation by combined perineal and suprapubic incisions; recti muscles inserted with portions of bone attached divided from pubes. Abdomen opened by median and right angle incision above pubes.	Sigmoid.	Died at end of operation; shock and hemorrhage.
Lindner, 1895.	1	..	M.	Carcinoma.	Extirpation.	Urethral; ureters did not drain.	Operative death; cancer of kidney was associated with that of bladder.
Zeller, 1896.	1	56	F.	Carcinoma.	Extirpation.	Vaginal.	Died in twenty-four hours of shock.
Göpel, 1897.	1	67	M.	Carcinoma.	Combined suprapubic and perineal operation.	Urethral.	Died of shock.

Deaths, 14. One later death = 15 total deaths. Operative mortality = 56.3 per cent. Directly referable to ureteral implantation = 5, and two others, in one of which uremia was cause of death fourteenth day, and pneumonia and renal infection in the other, fifth day.

TABLE OF CASES OF BLADDER RESECTIONS FOR THE REMOVAL OF MALIGNANT TUMORS OF THE BLADDER IN WHICH DIVISION OF THE URETER, ONE OR BOTH, AND IMPLANTATION INTO BLADDER WAS DONE.

Cases.	Sex and Age.	Ureteral Implantation and Manner of Treating Bladder.	Recoveries.	Subsequent Result and Causes of Death.
1. Bardenheuer, 1891.	.....	One ureter into remainder of bladder.	Recovery.	Death five months later due to recurrence. Ureteral orifice not contracted.
2. Albarran, 1894.	M. 50	One ureter into the bladder. Symphysiotomy.	Recovery.	Fourteen months remained in good health. Recurrence then appeared to take place.
3. Rehn, 1895.	M. 49	One ureter into bladder. Bladder closed. Wounds healed at end of six weeks. Operation, extraperitoneal.	Recovery.	Died of recurrence not long after having recovered from operation.
4. Kuster, 1896.	M. 32	Extraperitoneal operation. One ureter into bladder. Bladder closed.	Recovery.	Three months later was well. No further report.
5. Mikulicz, 1903.	F. 46	One ureter into bladder. Bladder closed.	Recovery.	One year later was free from recurrence and in good health. Bladder function was satisfactorily performed.
6. Mikulicz, 1903.	M. 50	Same, except that bladder was left open enough to drain. One-half of bladder was removed.	Recovery.	At end of one month, spontaneous urination. Later report lacking.
7. Berg, 1904.	F. 32	One ureter into bladder. Vaginal drainage of field of operation. Bladder closed.	Recovery.	Great improvement after operation, but at end of eight months recurrence.

FATAL CASES.

Cases.	Sex and Age.	Operation.	Result.	Causes of Death.
1. Giordano.	F.	Bilateral implantation into bladder.	Died thirteenth day.	Pelvic cellulitis and bilateral ascending renal infection.
2. Schilling, 1890.	M. 71	Extraperitoneal operation. One ureter into bladder. Closure of bladder. Hysterectomy done at same time.	Died fifth day.	No peritonitis. Death due to shock, chiefly. No renal infection.
3. Bardenheur, 1894.	M. 54	One ureter into bladder. Bladder and wound tamponed. Extraperitoneal operation.	Death shortly after operation.	Shock.
4. Schuchard, 1894.	F. 32	One ureter into bladder. Bladder tamponed.	Death tenth day.	Partial suppression of urine and uremia.
5. Helferich, 1896.	F. 36	Combined suprapubic and perineal exposure of the bladder. Bilateral implantation into bladder. Bladder closed.	Death fifth day.	Shock and ascending renal infection.
6. Albarran, 1896.	F. 51	Symphysiotomy to expose bladder. One ureter into the bladder. Bladder closed.	Death thirty-six hours.	Shock.
7. Israel, 1891.	M. 46	One ureter into bladder.	Death sixth day.	Ureteral implantation failed to hold. Pelvic cellulitis resulted.
8. Israel, 1891.	F. 39	Both ureters into bladder.	Death twenty-four hours.	Shock.

Total number of cases, 15. Deaths, 8. Due directly to ureteral implantation, 3, or 20 per cent.

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